

Secondary Math 3H SLO Review

Name _____ Date _____ Period _____

Perform the indicated operation.

1. $(-8x^2 + 2x + 1) + (10x^2 - x)$

2. $(5x^2 + 7x - 8) - (7x^3 + 2x^2 + 3x)$

3. $(-2y^2 + 3y - 1)(y^2 + 2y + 4)$

4. $(x - 2)(x^2 + 3x + 4)$

Use the given functions to find the following.

$f(x) = x^2 + 1$ and $g(x) = 2x - 3$

5. Find $h(x) = (f - g)(x)$.

6. Evaluate $f(-3) \cdot g(y - 2)$

For the given polynomials determine which of the binomials listed are factors.

7. $f(x) = x^3 - x^2 - 5x - 3$

a. $x + 1$

b. $x - 1$

c. $x - 3$

Without graphing, determine the end behavior of each, then write the end behavior as a limit.

$\lim_{x \rightarrow -\infty} f(x) =$

$\lim_{x \rightarrow \infty} f(x) =$

8. $f(x) = 2x^2 - 8x + 6$

9. $f(x) = -x^3 - x^2 - 3$

Without graphing, determine the **number** of zeros for each of the following polynomials.

10. $f(x) = x^4 - 2x^2 - 5x + 6$

11. $f(x) = -x^3 - x^2 - 5x - 3$

Identify the zeros, their multiplicity, determine whether they touch or cross the x-axis at each zero

12. $f(x) = (x + 1)(x - 1)(x - 3)$

13. $f(x) = 6x^3(x^2 - 9)(x + 2)$

Factor each expression using the polynomial identities. Show work!

14. $27y^3 + 8$

15. $x^2 + 6x + 8$

Factor each expression over the complex numbers. Use identities if needed. Show work!

16. $4x^2 + 49$

17. $x^2 - 10x + 26$

18. An auditorium has 30 rows with 10 seats in the first row, 12 seats in the second row, 14 seats in the third row, and so forth. How many seats are in the auditorium?

Use long division to rewrite the expression.

19. $\frac{2x^4 - x^3 - 4x - 2}{x^2 + x + 1}$

20. $\frac{x^3 + 2x^2 - 3x + 4}{x + 1}$

Perform the indicated operation. Simplify if possible

21. $\frac{x+5}{x-6} \cdot \frac{2x-12}{x^2-25}$

22. $\frac{x^2+5x-14}{3x^3-6x^2} \cdot \frac{2x^2+6x}{x^2+10x+21}$

$$23. \frac{2x}{x+5} - \frac{x}{x+8}$$

$$24. \frac{-6}{x-3} + \frac{5}{x-2}$$

Perform the indicated operation. All answers should be reduced. Show work!

$$25. \frac{x+3}{x-1} \cdot \frac{1-x}{x^2-9}$$

$$26. \frac{9}{m+2} + \frac{8}{m-7}$$

Solve the equation.

$$27. \frac{3}{x+2} + \frac{6}{x^2+2x} = \frac{3-x}{x}$$

$$28. \frac{4x}{x+4} + \frac{5}{x-1} = \frac{15}{x^2+3x-4}$$

$$29. \sqrt{4x-23} - 3 = 2$$

$$30. \sqrt{2x+3} - 7 = 0$$

Solve for the specified variable.

$$31. \frac{r_1}{r_2} = \sqrt{\frac{M_2}{M_1}}, \text{ solve for } M_2$$

$$32. \sqrt{b^2-4ac} = k, \text{ solve for } c$$

33. Determine if the functions are even, odd or neither.

a. $f(x) = -3x^4$

b. $f(x) = 2x^3 + 5x$

c. $f(x) = 6x^3 - x^2$

34. Graph the given function and determine the following:

$$f(x) = x^3 - 2x^2 - 3x$$

Relative maximum:

Relative minimum:

x-intercepts:

y-intercept:

On what interval(s) is the function increasing?

On what interval(s) is the function decreasing?

35. Graph the given function and determine the following:

$$f(x) = \frac{x^2 - 9}{x^2 - 2x - 15}$$

Domain:

Range:

Asymptotes:

Points of discontinuity:

36. Find the average rate of change on the specified interval.

The average high temperature per month in the city of South Jordan for the year 2012 is shown in the table below. Determine the average rate of change from September to December.

Month	Temp °F	Month	Temp °F
Jan	41	July	96
Feb	47	Aug	93
March	57	Sept	83
April	65	Oct	68
May	76	Nov	53
June	88	Dec	42

For the sequence, write the rational equation that models the relationship between the term in the sequence and its value.

37. $\frac{-1}{2}, 0, \frac{1}{4}, \frac{2}{5}, \frac{1}{2}, \frac{4}{7}, \dots$

Rewrite equation in exponential form.

38. $\log_3(3x - 2) = 3$

Find the inverse of each function.

39. $f(x) = -2\sqrt{x-5}$

40. $f(x) = \frac{\sqrt{x+3}}{6}$

Condense the expressions to a single logarithm.

41. $2\log x + \log y - 5\log z$

42. $4\log_3 x - 2\log_3 y + \log_3 z$

Find the value of each expression. Round to the nearest hundredth.

43. $\log_8 265$

Rewrite the equation in logarithmic form.

44. $6^x = 21$

Find the exact value of each expression using the unit circle. (No decimals!)

45. $\cos \frac{\pi}{4}$

46. $\sin \frac{5\pi}{3}$

47. Find all solutions in the interval $[0, 2\pi)$ for

$-8\sin x + 4 = 0$. Show all work!

48. Low tide is at 9:12 am and high tide is at 3:12 pm. The water level varies 48 inches between low and high tide. Write a cosine function to represent the change in water level. Show work!

Find the area of the triangle. Show work!

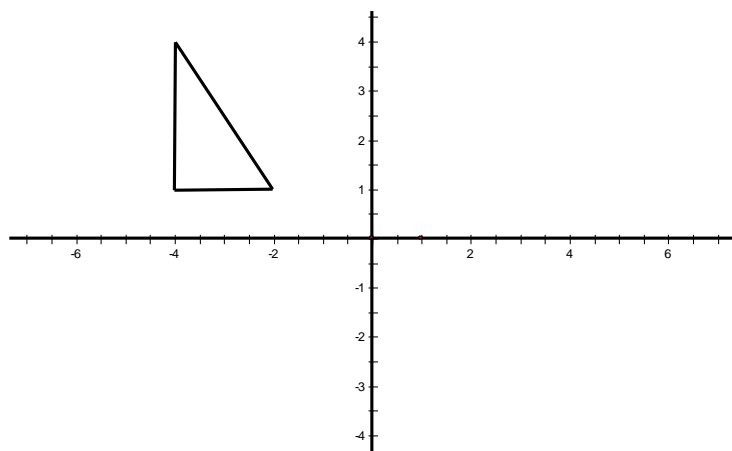
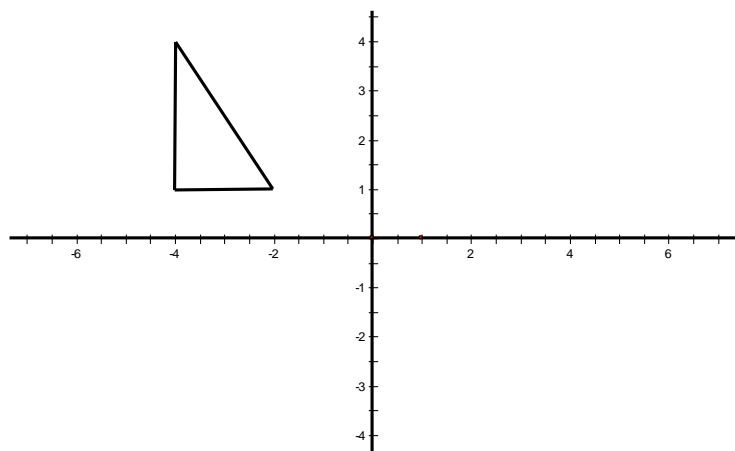
49. $A = 52^\circ$, $b = 14$ m, $c = 21$ m

Use the Law of Sines to solve the triangle. Show work!

50. $A = 49^\circ$, $a = 32$, $b = 28$

51. Fire-lookout station A is 5.4 miles from the tallest tree in the forest. Fire-lookout station B is 4.3 miles from the tallest tree in the forest. The line of sight from the tree to Station A, and from the tree to station B forms an angle of 37 degrees, how far apart are the lookout stations from each other?

52. Draw the result of rotating the given shape around the a) x-axis b) the y-axis.

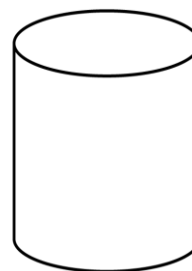


53. Given a cylinder, what two-dimensional shape will result from a

A) Horizontal slice?

B) Vertical slice through both bases?

C) Diagonal slice not through either base?



54. Your grandmother also needs some help in her yard. She would like to put some compost in her flower beds. One flower bed is shaped like a circle with a diameter of 7ft., the other is a rectangle with dimensions 3ft. by 6ft. The compost should be 3 inches deep. The compost is \$4.25 per bag and covers 2 cubic ft. How many bags of compost will be needed to fill both flower beds?

55. Use the given table below to answer the following.

A) According to the table, which city has the highest population density?

B) According to the table, which city has the lowest population density?

City	Land Size (sq. miles)	Population(Based on 2010 census)
South Jordan	22	50,418
Riverton	12.6	38,753
Herriman	20	21,785
West Jordan	31	103,712

56. The principal wants to know how many students eat school lunch each day. The principal decided to have teachers in their 1st period classes ask the students if they eat school lunch each day. This is an example of what kind of sample?

57. What is the parameter of interest in question 50?

58. A yoga instructor wanted to test the results of a new yoga workout. She had one class continue to do the regular workout and another class tried the new workout. What is this an example of?

- A) an experiment without a control group
- B) an experiment with a control group
- C) an observational study
- D) a voluntary sample survey

59. If the yoga instructor decided to randomly select students from her classes and monitor their workouts and record flexibility each week for 5 weeks this would be an example of

- A) an experiment without a control group
- B) an experiment with a control group
- C) an observational study
- D) a voluntary sample survey

60. Americans consume a mean of 23.4 pounds of candy per year with a standard deviation of 5.2 pounds. If the distribution is normal, what is the interval that contains

- A) 68% of the population?
- B) 95% of the population?
- C) 99.7% of the population?

61. A poll states that 56%, with a margin of error $\pm 3\%$, of the population supports a new park. According to these statistics, what is the smallest percent of people who support the park?